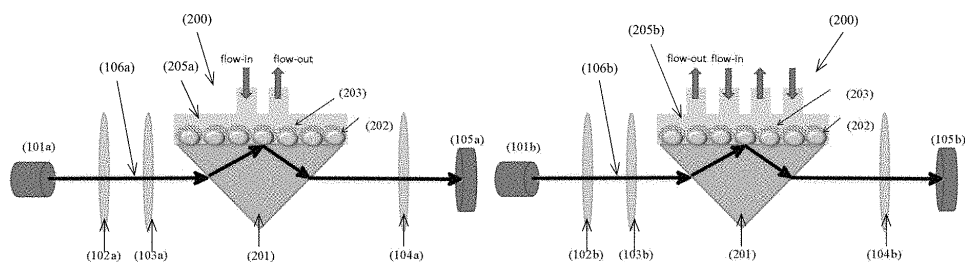


Optochemical Detector and a Method for Fabricating an Optochemical Detector



Health & Wellness

Waste Treatment/Management



Opportunity

Pollution is one of the most serious public health problems in cities around the world. Various pollutants or containments in water may affect the health of the general public. Therefore, the quality of water must be regularly examined to ensure that some poisonous or hazardous pollutants do not exceed safety levels.

The concentration of these pollutants may be determined by using testing agents. The traditional chemical testing approaches are time consuming and may not respond promptly. Alternatively, material characterization techniques in laboratories may be used to analyze the concentration of a target substance and even the composition of a testing sample. Although the results may be very accurate and sensitive, these techniques used in laboratories may not be suitable for daily applications which require prompt and low-cost testing results.

Technology

This invention relates to an optochemical detector and a method for fabricating an optochemical detector, although not exclusively, to an optochemical detector for a detection of trace lead ion Pb(II) in water using label-free localized surface plasmon resonance (LSPR) and optical interferometry.

An optochemical detector and a method for fabricating an optochemical detector includes a light generation unit arranged to emit a light signal; a probe cell unit arranged to alter at least one physical characteristic of the light signal in response to an interaction with a target substance; and a light detection unit arranged to receive the light signal altered by the probe cell unit; wherein a detection of the target substance is characterized by a change in the at least one physical characteristic altered by the probe cell unit.

IP Status
Patent granted



Technology Readiness
Level (TRL) ?

3

Inventor(s)

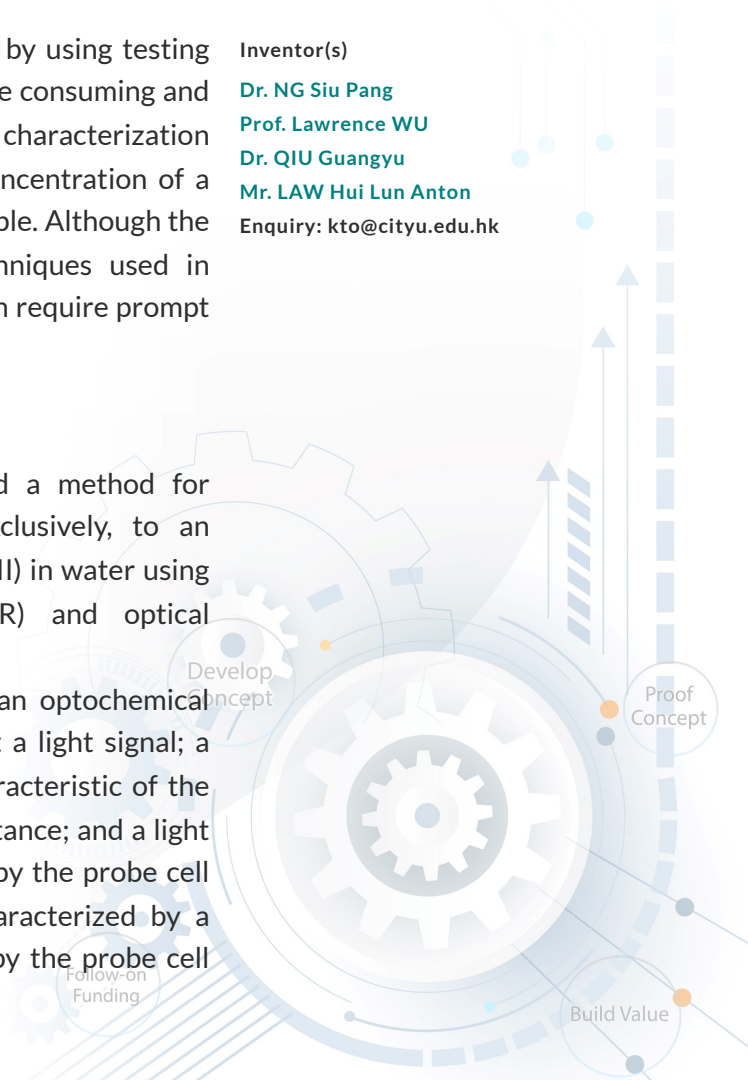
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Advantages

- The optochemical detector may provide up to ppb-level sensitivity of target substance, which may be useful in applications such as detecting trace lead ion Pb(II) in water, in particular Pb(II) ions concentration of about 10 part-per-billion (ppb) which is the safety threshold of drinking water specified by the World Health Organization (WHO) using label-free localized surface plasmon resonance (LSPR) and optical interferometry.
- The optochemical detector is based on a label-free detection with the ion-selection structure realized by the synthetic ionophore receptors in the probe cell unit, therefore, no DNA materials are needed.
- The probe cell unit is highly-selective to the target substance only, and does not require any amplification additives. The detector structure is also simple, which allow these optochemical detectors to be produced as compact devices with excellent robustness and portability.

Applications

- The optochemical detector

